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AUTHOR Galinski, Christian
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ABSTRACT

This paper examines needs, resources, and trends in the computer-based development of field-specific terminologies in varied languages. The range of special terminologies, their users, and their producers is noted, and the kinds of resources produced (data and tools) are outlined. Data types include: terminological information proper (information on field-specific concepts and their representation by linguistic and non-linguistic means); bibliographic data on publications in the field of terminology; and factual data on institutions, experts, programs, and other activities in the field. The differing processing systems required for each data type, and the forms of data presentation, are then described. Terminological tools include a variety of terminology application software: terminology management systems, databases, and data banks. Services related to the study of terminology include: consultancy and training in application of standards, tools, and project management; outsourcing for coping with limited terminological needs such as research on demand and creation and maintenance of software; and information services. It is suggested that Europe needs a public or semi-public infrastructure to promote, organize, and coordinate terminological activities by field experts and to organize networking. (MSE)

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The 'Terminology Market'

Christian Galinski

Infoterm
Heinestr. 18
A-1021 Wien
Tel.: +43 1 267 535 ext. 312
Fax: +43 1 216 3272

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1. Terminology products and services for whom?

Terminologies emerge among others
- in science and technology in the course of scientific and technical development,
- in crafts and arts in the course of new techniques and skills,
- in society in conjunction with new conceptions and approaches.

They are created primarily by experts of various levels, in a multitude of subject-fields, and in an "evolutionary" rather than systematic way. The experts being the primary creators and users of their domain-specific terminologies also cause communication problems such as homonymy and polysemy, which some of them try to resolve by means of descriptive or prescriptive terminology work. Terminology work, therefore, is carried out in a large number of subject fields usually by groups of experts. In addition, it should be remembered, that it is a time-honoured scientific tradition to define what one is talking about in scientific and technical texts – a good tradition often neglected in scientific discourse today.

Since science and technology increasingly influence more and more ways of life and society, deficient terminologies are causing communication difficulties not only in the respective peer groups, but also create problems for many people who have to use specialised terminology
- at their work places,
- as consumers,
- as citizens, and

increasingly even in inter-family communication. Potentially and to a growing extend, everyone is or could become a user of any specialised terminology more or less frequently in his/her life.

The gradually emerging "terminology market" will offer terminological products and services – which in fact are a particular category of information products and services – to a variety of consumers and clients, such as
- terminology creators (e.g., researchers, administrators, etc.),
- terminology data producers (e.g., terminology database creators, specialised lexicographers, etc.),
- terminology data distributors (e.g., dictionary publishers, on-line information services, etc.),
- terminology users in general.

Terminology creators, data producers, and data distributors in most or many cases are also re-users of existing terminological data.

2. Terminology products

Terminology products comprise
- different kinds of terminological data in different forms for different purposes and different user groups,
- terminological tools for various purposes.

Terminological data (if terminology documentation is included) comprise three distinct types of data, viz.:
- terminological data proper (i.e., information on domain-specific concepts and their representation by linguistic and non-linguistic means supplemented by a variety of associated data),
- bibliographic data on a variety of different publications in the field of terminology,
- factual data on institutions, experts, programmes, and other activities in the field of terminology.

Each type of data requires a different type of information processing system. A comprehensive terminology information and documentation centre like Infoterm has to take care of all three types of data and further subdivide them into such categories (according to the respective "objects") for different purposes. The data as well as the respective software can be used as "products" and as basis for a variety of "services".

The volume of the above-mentioned types and categories of data may be estimated as follows:
- terminological data proper – about 50 million entries across all subject – fields (in some 200 languages which are of relevance or potential relevance in terminology) – the increase is about parallel to the increase of specialised knowledge,
- bibliographic data – about a 250 000 entries (of which an estimated 200 000 contain information on technical dictionaries and lexicons) – the annual increase can be estimated at about 10%,
- factual data – about 50 000 entries (80% of which concern terminology committees, commissions, and working groups as well as terminological institutions at international, regional, and national levels) – the increase is difficult to estimate, but the biggest problem is fluctuation!

2.1 Terminological data

Terminological data can be offered
- in conventionally published form,
- as an electronic publication (only the data as such in a given format or in combination with software)
- through on-line information services.

In palm-top computers or smaller pocket-size dictionaries the terminological data may be implemented in inseparable combination/integration with the respective software or even hardware.

Terminological data can be acquired by customers on the terminology market for internal use only or for re-use, in the course of terminology data interchange, etc., on a variety of different data carriers (floppy disk, CD-ROM, etc.). Different user groups need terminological data of different degrees of complexity for different purposes.

Therefore, it is highly economical to prepare multi-purpose terminological data for different purposes and users whose needs are taken care of by appropriately tailored customer-specific user-interfaces. Terminological data can also be used very efficiently as the intellectual "skeleton", or infrastructure, around which the contents of a domain-specific encyclopaedia can be organised.

2.2 Terminological tools

Terminology application software is the most common tool for the handling of terminological data in some way or other. **Terminology management** systems (TMS) are designed as dedicated tools to record, store, process, and output terminological data in a professional manner. There are different kinds of TMS for different purposes. **Terminology databases** consist of terminological data and a TMS to handle these data. **Terminology data banks** (TDB) are more or less sophisticated organisational structures established for the handling and maintenance of terminological data with the help of a TMS. TDBs can comprise several or many terminology databases.

TDBs are often supported by a TMS running on a mainframe, mini-computer, or work-station, whereas today most of the PC-based TMS are applied by individual users, small co-operatives (integrated or not by an appropriate LAN), or larger departments (where the individual work-places are usually linked by a more or less sophisticated LAN).

On the one hand, TMS are increasingly further developed into tools for various applications, such as
- computer-assisted translation,
- authoring,
- spare-part administration, etc.

On the other hand, TMS modules of varying degrees of sophistication are integrated into all kinds of application software.

In the future, appropriately designed TMS or TMS modules will find big markets particularly in applications, such as
- co-operative writing (today a high percentage of the citizens of developed countries work more or less intensively in some form or other as "technical writers"),
- documentation (in the meaning of information and documentation, and of archiving and filing), and
- co-operative terminology work.

If appropriate tools were available for computer-assisted terminology work, the preparation, processing, and maintenance of terminological data could be carried out faster, more efficiently, and according to modern quality approaches. Needless to mention that this would significantly aid the terminology market to develop.

3. Terminology services

At present the following terminology services already exist or are foreseeable in the future:
- consultancy and training services,
- outsourcing,
- information services.

3.1 Consultancy services and training

Consultancy services and training are most often needed with respect to application aspects, such as
- application of terminological principles and methods (especially the appropriate application of existing standards),
- selection and application of tools,
- terminology project management.

As a rule, experts today have not studied the basic theory of logic and epistemology underlying the science of sciences, or science theory which also comprises the basic theory of terminology. Therefore, they often need training in theoretical and methodological basics of terminology science and terminography. Large organisations/institutions often need to include terminological methods and tools into their information management or quality management schemes. Government agencies and other public authorities in many countries want to implement knowledge transfer policies, which would greatly benefit from the appropriate terminology planning methods. Institutions and organisations frequently also need advice with respect to legal problems (especially related to intellectual property rights) concerning the application of terminological data and tools.

However, it needs to be mentioned that with a few exceptions (e.g., China) these needs are still latent, decision makers not being aware of the usefulness and effectiveness of such services. For this reason and a lack of funds it is still a dormant market.

3.2 Outsourcing

Increasingly institutions and organisations of all sorts consider outsourcing an appropriate method to cope with certain limited terminological needs. For instance, outsourcing can refer to

- **research and development on demand, concerning new tools or applications, adaptation of existing tools, etc., such as**
- TDB design and implementation,
- meta-browsers for information networks, etc.
- **terminology work on demand with respect to**
  - terminology preparation,
  - terminology maintenance (including among others: revision and updating),
  - conversion or merging of terminological data,
  - evaluation of terminological data, etc.
- **maintenance and aftercare services with regard to**
  - TDB software maintenance and upgrading,
  - comprehensive data holdings maintenance, etc.

3.3 Information services

Increasingly, terminological products and services will – much like the general situation in the field of information and communication technology (ICT) – be available through all kinds of information services. They will also increasingly be integrated into other ICT applications.

4. Need for a dual terminology infrastructure in Europe

Given the amount of terminological entries across science, technology, and other subject-fields to be prepared in a multitude of languages, the monumental task of collecting terminology cannot be performed without the help of millions of experts who need to carry out this task anyway if they want to work and communicate efficiently. In most cases today such terminology work is carried out in the form of thousands of small efforts scattered all across the globe and subject-fields with little inter-connection. As a rule, it is performed in a non-commercial (not to say non-profit) framework.

Therefore, it would require a public or semi-public infrastructure

- to promote, organise, and co-ordinate terminological activities by domain experts in the public interest and with a non-profit and non-commercial approach which would take into account multiple user needs,
- to organise networking between many projects in which domain experts perform (preferably co-operatively) terminology work.

For the distribution of terminological data to different user groups with various user needs, efforts should be made to establish market-oriented networks for providing

- terminological data and other products as well as
- terminological services

on a commercial basis. The clients will thus have to pay for terminological products and services. The more clients can choose among an ever increasing variety of terminological products and services, the more affordable these will become.